6800 SOAP

The Stack Oriented Arithmetic Processor (SOAP) was created for the 6800 specifically to handle the arithmetic processing chores for system programs (i.e., interpreters, compilers, etc.) The stack structure allows easy processing of expressions as well as fast operand transfer. The arithmetic is done completely in binary, yielding much faster execution than equivalent BCD notation packages. The floating point operations use 3 bytes for the mantissa and 1 byte for the exponent. Included in the package are routines for floating point or integer add, subtract, multiply, and divide. Other routines include conversion to and from ASCII. This package requires approximately 2K bytes of memory (RAM or ROM). Listing only.

SL68-25 6800 SOAP 25.00

Floating Point Package

If you need some real arithmetic computing power, this program is for you. BCD notation is utilized to facilitate simple I/O conversion. Add, subtract, multiply, and divide are implemented in 512 bytes using a 9-digit mantissa and a 2-digit exponent. This gives a useful range of 1.0 E-9 to 9.99999999E+99. To familiarize you with the use of the floating point routines and the internal notation, we include a free I/O driver routine that implements a simple four-function calculator in 512 bytes. Listing only.

SL68-4 6800 Floating Point Package 25.00

Scientific Functions Package

This package implements the following functions: SIN, COS, TAN, ARCSIN, ARCCOS, ARCTAN, LOG, ANTILOG, NATURAL LOG, EXPONENTIALS, SINH, COSH, TANH, SQUARE ROOT, INVERSE, and X to the Y power. On trigonometric functions you can use either degree or radian mode by changing an indicator byte, even under program control. Listing only. NOTE: This program requires the Floating Point Package described above!

SL68-20 6800 Scientific Functions 25.00

Relocator

The Relocator will, as the name implies, relocate blocks of machine language code from one place in memory to another. A special feature allows you to load programs into any place in memory from a tape prepared for some specific location. In order to properly use this package on a program, you must know where the program starts and stops and all places in the program which contain data as opposed to executable code. Just over 1K of RAM is required starting at 200 hex for the 6800 version, and 1000 hex for the 8080, but since the Relocator can actually relocate itself, you can move it anywhere you want! The source listing includes a complete manual for use.

SL68-28 6800 Relocator (LC) 25.00
SL80-13 8080 Relocator (LP) 25.00

6800 Disassembler

This 6800 object code disassembler is an extremely valuable tool for those who wish to modify existing software for their machine. This program will generate a source listing whose format is almost identical to the original source listing, the absence of symbolic labels being the exception. For those with narrow output devices (32 to 40 columns) the output has been limited to 31 columns. The disassembler requires approximately 1.5 K of memory beginning at 1900 Hex.

SL68-27 6800 Disassembler (LC) 25.00

Micro BASIC Plus

A subset of the standard definition of BASIC, Micro BASIC Plus is the most complete small BASIC available. The only major limitations are integer-only math and the lack of string variables. Features a built-in editor, multiple statements per line, arrays, a calculator mode, and a machine language subroutine call. 3.3K in length, source listing included.

SL68-19 6800 Micro BASIC Plus (LC) 25.00

Space Voyage

This is the best assembler language version of this famous space simulation game. Most Star Trek type games require lots of memory (as much as 20K) since they are written in BASIC. This version will run in only 4K and has all of the features. Two versions of the game are self-contained, a short one requiring 20-30 minutes to play, and a long version requiring over an hour.

SL68-5 6800 Space Voyage (LC) 25.00
SL80-9 8080 Space Voyage (LP) 25.00

6800 Mini-Monitor

This 6800 assembler language program is for those lacking the capability to load or punch Motorola's Mikbug format cassette or paper tapes. Mini-Monitor is a relocatable package providing I/O routines, a tape load command, a tape punch/record command and a go to user's program command. This program is ideal for those systems with no (or non- standard) monitors. Approximately 320 bytes. Listing only.

SL68-21 6800 Mini-Monitor 5.00

6800 Game Package III

Contains the following assembler language programs: Hangman, Acey-Ducey, Craps, Floating Point Package, Klingon Capture, Line Editor, Random Number Generator, Mastermind, Card Shuffle and Deal, Number Guess I, Number Guess II, Hurkle, Rover, Switch, and Chomp. Printed listings only.

PD68-3 6800 Game Package III 25.00

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111 Providence Rd.
CHAPEL HILL, NC 27514
(919) 493-1451

Quan.	Part No.	Description	CPU	Media	Price	Ext.

What computer system do you use? _____

What disk system do you use? _____

Name _____ Subtotal

Street _____ Add 3% postage/handling
Add 10% Foreign

City _____ Taxable subtotal

State _____ Zip _____ IN res. add 4% sales tax

Total

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Box 2570
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Telephone: (317) 463-2502
Telex: 27-6143

software catalog

technical systems consultants, inc.

Technical Systems Consultants, Inc. is the world's leading supplier of 68XX-based software. Several programs for 8080- & Z80-based systems are also available. All software is written in assembler language which promotes efficiency and obviates the need of a higher level language. All of the programs include a very thorough user's manual; and, some include the complete source listing. Overall, these packages are the most comprehensive in the industry.

General Information

All of our software resides in the low end of memory unless otherwise stated. The 6800 & 8080 software in general is not ROMable. All of the 6809 software is fully optimized for 6809, is position-independent and reentrant, unless otherwise noted. All software not written for a specific disk operating system (such as FLEX) is well documented for ease of adaption to most systems. In most cases, only two I/O locations need be altered.

Software Development

Technical Systems Consultants is constantly developing new products. It is next to impossible to keep any kind of current brochure listing all programs available. Several programs which are under development at the time of this writing include a C compiler, a Pascal compiler, and a new multi-user, multi-tasking operating system, all for the 6809 and 68000. Also in the works are an advanced Text Processor, screen-oriented editor, and several versions of FLEX for various hardware configurations. Please feel free to call or write to determine the availability of these products.

Software Registration

Software purchased directly from Technical Systems Consultants is automatically registered. If you purchase from a dealer, make sure he is authorized and can provide you with one of our Registration Cards. This card should be completed and mailed to us immediately for your protection. Please be reminded that all of our software and documentation is protected by federal copyright laws. It is a federal offense to make copies of any of our products. Buying our products will promote future software development; copying them will not.

Media

Most software is available on some type of media. All 6800 and 6809 disk programs are for use with the FLEX operating system and available on either 5¼" or 8" soft-sectored, FLEX compatible diskettes. Disk software for 8080 is for CP/M (CP/M is a trademark of Digital Research) and is available in single density, soft-sectored 8" format or in single density, 10-hole hard-sectored 5" format which is North Star compatible. Tape cassettes are 300 baud, Kansas City Standard, Motorola S1 format. Paper tapes for 8080 are Intel ASCII hex format. Please specify the exact media required when placing your order.

Ordering Information

When ordering software it is essential that you specify the microprocessor and media desired (ie., 6809 5" FLEX disk). This catalog has codes next to most prices which signify on which media the program is available. These codes are letters which mean the following:

L . . . Program is available in printed source form. Note that this printed listing is a non-disk version. The cost of this listing is not given, but may be computed by subtracting $10.00 from the stated price. For example, a printed listing only of the 6800 Text Editing System would cost $30.00 and would be a non-disk version.

C . . . With Cassette.

P . . . With Paper Tape.

D . . . With 8 or 5¼ inch floppy diskette.

There may also be a date (month/year) with the media code. If so, this indicates the program will not be available until that date. Some prices do not have a media code. In these cases, the type of media available will be stated in the program description.

Payment may be made by check, money order, Master Charge, or Visa. We also ship UPS C.O.D. Please include 3% for postage and handling. Foreign orders should remit in funds drawn on a U.S. bank or by international money order and should include 10% postage and handling.

August 1981
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FLEX™ and UniFLEX™ are trademarks of Technical Systems Consultants, Inc.

The FLEX™ Disk Operating System

FLEX has become the standard disk operating system of 6800 and 6809 users. A single user system, it was designed to be very powerful, yet very easy to learn and comfortable to use. Some of FLEX's features are dynamic filespace allocation, random and sequential file accessing, batch job type program entry, user startup facility, automatic drive searching, file dating, space compression, complete user environment control, English error messages, and over 20 commands for all normal disk operations. 8K of RAM is required at $A000 for 6800 or $C000 for 6809 and a minimum of 12K of user memory must be in low memory. Price includes user's manual, advanced programmer's guide, editor, assembler, and object code diskette. FLEX is not relocatable or reentrant. These systems are supplied on 8- or 5¼-inch soft-sectored floppy disks.

For SWTPC . . . These versions are for Southwest Technical Products' 8 inch DMA disk system or their 5¼ inch minifloppy system.

AP68-1S	**6800 FLEX for SWTPc**	**150.00**
SP09-1S	**6809 FLEX for SWTPc**	**150.00**

For SSB . . . These versions are for Smoke Signal Broadcasting's 8- and 5¼-inch disk systems.

AP68-1B	**6800 FLEX for SSB**	**150.00**

For EXORciser™ . . . These versions are for Motorola's EXORciser systems using EXORdisk™ II or III. No hardware modifications are necessary; the user simply boots from a FLEX disk instead of an MDOS™ disk. 8-inch disk only. (EXORciser, EXORdisk, & MDOS are trademarks of Motorola, Inc.)

AP68-1E	**6800 FLEX for EXORciser**	**150.00**
SP09-1E	**6809 FLEX for EXORciser**	**150.00**

For General Use . . . These versions are for general use in that they are prepared and documented so that a user can customize them for most any hardware system. The user writes terminal I/O driver routines and disk I/O driver routines for his hardware and appends them onto the body of FLEX. Through the driver routines, FLEX can be adapted to almost any random access mass storage device from minifloppys to Winchester technology disks. However, since these versions of FLEX are supplied on soft-sectored floppy disks, the system must have at least one soft-sectored 8- or 5¼-inch floppy disk drive in order to initially bring FLEX up. Note also that all FLEX support software from Technical Systems Consultants is supplied on soft-sectored floppies. This package is not for beginners! It assumes the user is capable in assembly programming and in the disk controller interface hardware. Technical Systems Consultants will not assist in adapting this FLEX and disclaims all responsibility for the adapting and functioning of this software on custom hardware!

AP68-1G	**General 6800 FLEX**	**150.00**
SP09-1G	**General 6809 FLEX**	**150.00**

The UniFLEX™ Operating System

UniFLEX is a true multi-user, multi-tasking operating system for larger microcomputers. Some of its capabilities include hierarchical file system, device independent and inter-process I/O, a system command language, user login and passwords, full file and task protection, 'pipes', I/O redirection, task swapping, user accounting, and system support of large amounts of memory and disk storage. The system has been designed for the 68000 and 6809 processors. The standard system supports approximately 50 system calls and includes about 60 utility commands, including a text editor and assembler. A full line of support software is also available, including text processing programs, C compiler, Pascal, diagnostics, BASIC, BASIC precompiler, sort/merge, debug packages, and more. To completely describe this operating system would require more space than this entire catalog. Two separate publications are available, a 6 page brochure, and a 16 page overview.

UFDB	**UniFLEX Brochure**	**free**
UFOV	**Overview of UniFLEX**	**1.00**

BASIC Precompiler for 6800 & 6809

This package allows the user to write BASIC programs in a non-standard BASIC source format. This non-standard format includes unlimited length variable names and alphanumeric line labels instead of line numbers. As an example, subroutines may be given a name and called by that name instead of a line number. Line numbers are not required at all and comment lines may be inserted anywhere. All these features produce a very readable, well-documented, easy-to-correct and maintain BASIC program. The output of the precompiler is in the BASIC compiled form, allowing application programs to be written, precompiled, and then distributed in a non-source form. This precompiler can only be used with Technical Systems Consultants' BASICs. The standard BASIC Precompiler must be used with standard BASIC and the Extended BASIC Precompiler must be used with Extended BASIC.

AP68-13	**6800 Standard Precompiler**	**(D) 50.00**
SP09-7	**6809 Standard Precompiler**	**(D) 50.00**
AP68-14	**6800 Extended Precompiler**	**(D) 50.00**
SP09-8	**6809 Extended Precompiler**	**(D) 50.00**

Sort/Merge Package

This allows the contents of any size file to be sorted. Written in assembler language, it is extremely fast. Sort parameters may be supplied as part of the command line, through an interactive parameter editor, or through a disk file. The package is a full-disk sort/merge, meaning that files too large to fit in memory will be broken into multiple, temporary work files which are individually sorted and then merged into one. The final output file may be routed to disk, CRT, or printer. Accepts fixed or variable length records, up to 20 ascending or descending keys, non-ASCII sequences, and much more.

AP68-10	**6800 Sort/Merge Pkg.**	**(D) 75.00**
SP09-10	**6809 Sort/Merge Pkg.**	**(D) 75.00**

BASIC for 6800 & 6809

Currently the fastest floating point BASIC interpreter available for any 8 bit micro, this version supports all of the standard BASIC statements and functions as well as many extended capabilities. Both floating point and string variables are provided with strings being fully dynamic and unrestricted in size. Other features include single and double dimensioned arrays, an 'IF..THEN..ELSE' construct, HEX function, and the constant PI. Array size, loop nesting, subroutine nesting and string length are only limited by the amount of user memory available. The floating point arithmetic done by BASIC is performed to seven digits accuracy internally, with all answers printed to six. The dynamic range of the numbers is 10 raised to the plus or minus 37th power. The disk versions support ON ERROR GOTO statements for complete user program control. A COMPILE command allows BASIC to save programs to disk in a concise, non-source recoverable form which permits proprietary software distribution. The standard SAVE and LOAD commands work with standard FLEX text files. Program TRACE and a RENUMBER facility have also been added to the disk BASIC. The disk versions support I/O in the form of sequential files and two random access file structures, Record I/O and Virtual Arrays. The cassette versions are easily adapted to run in any 6800 or 6809 system having at least 12K of user RAM available from location 0000. A system with 16K or more of memory is recommended for serious applications and for the disk versions. Price

AP68-11	**6800 BASIC w/cassette**	**(C) 75.00**
AP68-11	**6800 BASIC w/disk**	**(D) 75.00**
SP09-4	**6809 BASIC w/cassette**	**(C) 75.00**
SP09-4	**6809 BASIC w/disk**	**(D) 75.00**

Extended BASIC for 6800 & 6809

This BASIC is ideal for business or advanced scientific applications where extended math precision and formatting capabilities are essential. All of the features of our regular BASIC are supported plus much more. The floating point math package provides 16.8 digits of precision. Most of the math functions are accurate to 16 digits with a minimum accuracy of 13.5 digits. Integer variables are also allowed for speed in control loops and array indexing. PRINT USING has been included in this BASIC and supports string formatting, number fields, dollar and asterisk fill, trailing minus sign, imbedded commas, and scientific notation. A DIGITS statement allows the user to set the maximum number of digits printed in a number as well as the maximum number of fractional digits. New string functions have been added for string searching (INSTR) and for creating a string which is the date (DATE$). DPEEK and DPOKE are 16 bit peek and poke type functions which make address manipulations in BASIC a breeze. The INCH$ function allows single character input from the terminal. Programmer control of CTRL C has also been added. Extended BASIC is 19K in length with 32K of user memory recommended for operation.

AP68-12	**6800 Extended BASIC**	**(D) 100.00**
SP09-6	**6809 Extended BASIC**	**(D) 100.00**

Text Editing System

The Text Editing System for the 68XX and 8080 is one of the most complete microprocessor text editors available. Unlike cumbersome character-oriented editors, this one is line and content-oriented. All of the standard text editing commands are available. Some of the more powerful commands included are COPY and MOVE for easy text manipulation. The CHANGE command allows local or global string replacement within lines. The DELETE and INSERT directives allow easy insertion or deletion of single or multiple lines. OVERLAY and APPEND provide a variety of methods for line alteration. The REPLACE command is used for single or multiple line replacement. Another set of commands allows for easy positioning of the line pointer. Simple commands such as TOP, BOTTOM, and NEXT are available, as well as the powerful FIND command which will search for one or more occurrences of a specified string. Several environment directives exist for defining TAB, FILL, EOL, and LINO characters. The HEADER command displays a heading of column numbers. VERIFY and RENUMBER commands are also supported. String searches may be limited to specified ZONES and lines. All lines may be referenced by their number, position, or content. The disk versions are "disk to disk" allowing any size file to be edited. Overall, the Text Editing System is an advanced tool for those extensive editing jobs. The program requires approximately 6K of RAM.

SL68-24	**6800 Text Editor**	**(LCD) 50.00**
SP09-2	**6809 Text Editor**	**(CD) 50.00**
SL80-10	**8080 Text Editor**	**(LPD) 50.00**

Mnemonic Assembler System

The Mnemonic Assembler System is the ideal addition to the Text Editing System to form a complete program development center. All standard assembler language mnemonics are supported. Labels may be any length with six characters significant. Expressions may contain decimal, octal, hex, or ASCII values and support mathematical operations. All standard assembler directives or pseudo-ops are included as well as such features as page formatting, titling, listing control, object code output control, and a sorted symbol table listing. The disk versions allow decimal line numbering and auto field formatting. The 6809 version supports conditional assembly and macro capability and accepts relational and Boolean operators. This assembler was designed for ease in adapting to various systems and the manual describes this process. 6800 and 8080 are 6K while 6809 is 12K.

SL68-26	**6800 Assembler**	**(LCD) 50.00**
SP09-3	**6809 Assembler**	**(CD) 50.00**
SL80-12	**8080 Assembler**	**(LPD) 50.00**

6809 Cross Assembler

This 6809 assembler runs on a 6800 FLEX system. Has all the features of the resident 6809 assembler described above.

AP68-16	**6809 Cross Assembler on 6800**	**(D) 100.00**

Pascal for 6809

This Pascal is a true native code compiler which produces assembly language mnemonics. The specification for the syntax and semantics is based on the Jensen and Wirth User Manual. Both integer and double precision floating point math are supported with the standard trigonometric, exponential and square root functions and a random number generator. Records, arrays, sets, pointers, dynamic storage, file I/O with GET and PUT, and calling another Pascal program from a Pascal program are all implemented. UniFLEX supports both random and sequential file access; FLEX supports only sequential file access. The user may pass parameters, such as file names and options, from the command line to the user's Pascal program. Note that both the operating system and run-time library must be resident to execute a user's program. The FLEX version of Pascal requires a 56K system in order to function, and the minifloppy version requires two diskettes.

SP09-15	**6809 FLEX Pascal**	**(D) 200.00**

Text Processing System

The Text Processing System allows the use of over 50 commands for special text formatting applications. The commands included will support multiple spacing, left margin control, indenting, the ability to save contiguous text, paging, left hand justification, right hand only justification, left and right justification, centering, no-fill modes, page numbering, the printing of left, right, or centered titles, and line length control. Also included are capabilities for macro definition to define and build special formatting commands, number registers which can be used like variables in a program, conditional command execution, and text diversion for later use (such as footnote processing). The Text Editing System is recommended for use with the Text Processor since the processor contains no built-in editing functions. Program requires approximately 8K and is not position-independent or reentrant.

SL68-29	**6800 Text Processor**	**(LCD) 75.00**
SP09-13	**6809 Text Processor**	**(D) 75.00**
SL80-11	**8080 Text Processor**	**(LPD) 75.00**

68000 Cross Assembler

A 68000 assembler which runs on a 6809 FLEX or UniFLEX system. Close in syntax to Motorola's 68000 cross assembler, it supports full 32 bit math, macros, and conditional assembly.

SP09-14	**68000 Cross Assembler**	**(D) 250.00**

FLEX Utilities

This package of additional FLEX utility commands includes memory dump, prompting delete, extended directory display, binary program mapper, and so on. 6800 has 36 additional utilities while 6809 has 17. Source included on disk.

AP68-15	**6800 FLEX Utilities**	**(D) 100.00**
SP09-11	**6809 FLEX Utilities**	**(D) 75.00**

Debug Package

The Debug Package is a complete, assembler language, program debugging tool capable of simulating the functions of the MPU. Up to 32 breakpoints may be defined in RAM or ROM. Each breakpoint may cause one or more of eight possible actions to be performed when it is encountered. Breakpoints may be made conditional on the exact content of a register, or on the condition of a memory location being zero or non-zero. Pass counters can be specified to delay or limit the triggering of a breakpoint. A "histogram" breakpoint allows the counting of the number of times a point in the program is reached, providing data for later program timing and optimization. During simulation, program tracing may be enabled or disabled at any time, or made contingent on subroutine nesting depth. During trace, register content and a disassembly of each instruction are displayed. Single-step and multiple-step capabilities are included. At any time, it is possible to list the previous 256 instructions executed. During simulation, sections of memory may be execute-protected, write-protected, or read/write-protected. A simulation protection feature allows debugged subroutines to be executed in real-time. Execution traps permit simulation to halt on execution of interrupt-related instructions, branch instructions, subroutine nesting level, and instruction count. General features include a simple line-at-a-time assembler, disassembler, memory and register, modification commands, a two-function hex calculator, and a machine states counter for program timing. Interrupts may be simulated by the user from the keyboard or by instruction count. In all, over 50 commands are available. 6800 version is 9K in length and 6809 is 12K.

SL68-30	**6800 Debug Package**	**(LCD) 75.00**
SP09-5	**6809 Debug Package**	**(CD) 75.00**

FLEX Diagnostics

The utility programs in this package are designed to run under the FLEX Operating System. Included in the memory diagnostics portion of the package are zeroes and ones test, random pattern test, walking bit tests, dynamic RAM dropout test, and a convergence test. All memory tests are position-independent. The disk repair portion of the package contains utilities which operate on a FLEX-formatted diskette. Included are three diagnostic utilities which report unreadable sectors and structural inconsistencies among the files on the diskette, two utilities for recovering data when the directory on the diskette is not readable, a utility to remove bad or intermittent sectors from the free space, a program to retrieve deleted files from the diskette free chain, a single-sector read/write/modify routine, and a copy utility which ignores CRC errors. The manual includes descriptions of the diagnostics, some background information of types of errors, and troubleshooting guides.

SP09-12	**6809 Diagnostic Pkg.**	**(D) 75.00**
AP68-18	**6800 Diagnostic Pkg.**	**(D) 75.00**